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Dear Lederberg

Thanks for the reprints. In "A view" p 121 I would have added a fourth line in favor of DNA, its stability as shown by labelling studies in tissues where few nuclei are dividing. For clearly in any given cell at any given time most genes must be metabolically inactive, while other constituents except "mechanical scaffolding" need not be so. I congratulate you on your last sentence.

In 1956 I drew up a specification for a primitive cell in "The planet earth" (Pergamon Press) which is not so good as yours, but may be of interest. I have been trying in vain to find a paper (?1935) where I perhaps foreshadowed the description of genes as information. I compared heredity at the gene-chromosome level to the copying of ancient manuscripts. Changes may occur (A) between copyings (B) At copyings. (A) include (1) Deletions. (2) Damage which may lead to false copying . (3) "Glosses", or deliberate interpolations. Thus notes incorporating theological opinions seem to have got into the Christian Scriptures.

(B) include (1) Deletions (2) Duplications (3) Translocations (or pages in the wrong place, etc) (4) Mistakes of individual letters (5) Mistakes concerning whole words. These are apt to be "constructive", i.e. to make some kind of sense.

I stated that there was no evidence for A3 or B5 in genetics, nor for inversions in paleography. But natural selection will certainly conserve B5.

Have you ever thought of this model for selection? Tables of logarithms are copied out. Each copy is tested for internal consistency (but not for all possible internal consistencies) E.g. if log 1·3 + log 2·7 is not equal to log 3·51 the copy is burned. The copyist takes a pair of surviving tables, and copies his new one from bits of each. He sometimes adds an extra random figure, which of course is subject to selection. I guess one might make a seven-figure table from a four-figure one in 600 million years or so. Get one of your mathematical colleagues to work it out.

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Yours sincerely,

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